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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,758	08/14/2002	Jeffrey Thomas Remillard	201-1006 FAM	9670

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EXAMINER	
JOHNSTON, PHILLIP A	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/064,758	REMILLARD ET AL.	
	Examiner	Art Unit	
	Phillip A Johnston	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☒ Claim(s) 1 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 8-14-2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2-2-04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Claims objection

1. The disclosure is objected to because of the following informalities: Claim 1 which reads "said output surface being curved in a direction"; should be, "said input surface being curved in a direction".

Appropriate correction is required.

Claims Rejection – 35 U.S.C. 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-20, are rejected under 35 U.S.C. 102(b) as being unpatentable over U.S. Patent No. 6,028,722, to Lang, in view of Hososkawa, U.S. Patent No. 5,513,289.

Lang (722) discloses a Semiconductor laser array 66 in FIG. 21 comprises a plurality of laser device that are master oscillator power amplifiers (MOPA's) comprising stripe regions 67 which are pumped to function as a laser and diverging gain regions 68 which are biased to provide additional gain to the developed high

power laser output to produce beams 62 of high power content. The output of beams 62 are divergent in both the lateral direction (FIG. 21) as well as in the transverse direction (FIG. 22) so that lens system 60 provides orthogonal quasi-collimation. Lens system 60 comprises an array of input cylinder lens 63 extending in the transverse direction, one for each laser emitter, for collimating the radiation in the lateral direction and a single output cylinder lens 64 extending in the lateral direction for collimating the radiation in the transverse direction. By varying the focal length of the curvature of cylindrical lens 63, quasi-collimator 60 can collimate the beam to any selected height in the transverse direction. Output 69 is then provided as input to a reconfiguring system such as prism device 10 or 20 or to an optical handling system 50 as shown in FIG. 20. Other laser sources, beside MOPAs, e.g., unstable resonator or multimode laser sources, are also possible. See Column 14, line 13-42.

Lang (722) also discloses in FIGS. 23 and 24, another embodiment for the cylinder lens array 53 and beam filling optics 54 of FIG. 20. Semiconductor laser array 76 comprises a plurality of laser stripes 77 forming output beams 72 collimated by individual cylinder lenses 73 of lens system 70. The asymmetric output of the laser array requires some collimation in the fast axis or transverse direction, which is accomplished by cylinder lenses 73. The slow axis or lateral direction requires a precise alignment of adjacently aligned cylinder lenses. This arrangement can be accomplished by a discrete array of cylindrical lenses 73 which are comparatively inexpensive. Lens system 70 further comprises a lens support holder 78 having pairs of concave-shaped cradle regions 75 to receive the curved portion of a single cylinder

lens 73 for proper alignment relative to the spacing of stripes 77 of laser array 76. The cradle supports 75 provide for proper maintenance of the center-to-center spacing of lenses 73 relative to stripes 77 despite variations in their lens size, which is typical among such cylindrical lenses. Support holder may be made of silicon and machined or etched to provide lens cradle regions 75. As best seen in FIG. 23, cradle regions 75 are in pairs at opposite ends of slot 74 so that output 79 from cylinder lenses 73 proceeds through slot 74 to a beam reconfiguring system such as prism device 10 or 20 or to an optical handling system 50 as shown in FIG. 20.

Also FIG. 25 illustrates a converging lens system 80 for equalizing the aspect ratio of the output beam 52B from the beam reconfiguring device of this invention, such as from optical handling system 50. Lens system 80 comprises a slab optics element having converging sides 81 (wedge shaped) and an input end 82 of cylinder lens shape (curved in a direction perpendicular to the height) to collect the radiation and optically converge the light to an output 84 forming a substantially symmetrical spot for delivery to a symmetrical apertured device such as an input end of an optical fiber. See Column 14, line 43-67; and Column 15, line 1-10.

Lang (722) further discloses that the basic problem with coupling the optical output of a multiple emitter radiation source to an aperture limited waveguide device, such as an optical fiber, is that of coupling asymmetry: how to efficiently provide delivery of substantial optical power from a source comprising one or more semiconductor laser elements that provides a beam having a large aperture-times-divergence product aspect ratio to a small substantially orthogonally symmetrical spot

acceptable to the input aperture of an optical handling medium or device which receives delivery of the reconfigured optical beam. In the case of an optical device such as an optical fiber, the spot size of the focused beam must be equated to its input diameter and its acceptance angle (numerical aperture) in two orthogonal directions. Since the orthogonal divergence angles and aperture dimensions of the output beam from a semiconductor laser array are different in the lateral and transverse directions, it is difficult to simultaneously achieve a beam with the same spot size and divergence in orthogonal axes suitable for optically symmetrical applications requiring high optical power, such as focusing to meet the numerical aperture requirements of an optical fiber. See Column 1, line 17-38.

It should be noted, that owing to the necessity for meeting the numerical aperture requirements for coupling to any optical fiber, as stated above, it is implied herein that the dimensions of the Lang (722) apparatus are equivalent to the dimensions recited in Claims 9 and 16.

Lang (722) as applied above does not disclose the use of an input surface faceted in a direction along the height (h), as recited in Claims 1 and 4. However, Hosokawa (289) discloses in that in the optical circuit in accordance with the present invention, an optical waveguide is fixed on a substrate by use of an adhesive agent such that an optical element of the projection or depression shape (faceted) is integrally formed in the optical waveguide surface. Column 8, line 19-32.

Also FIGS. 9 to 15, diagrams for explaining application examples of optical devices which can be manufactured according to the optical device manufacturing

method, which include a grating (FIG. 9), a blazed grating (FIG. 10), a chirped grating (FIG. 11), a flat micro-lens (FIG. 12), a Fresnel lens array (FIG. 13), a micro-lens array (FIG. 14), and an optical disk (FIG. 15). Various application fields are considerable in which a Fresnel lens is produced with a material having a high refractive index and in which a transparent conductive substance (ITO) is employed as the material. See Column 11, line 33-46, and Figures 9-15 below.

Fig.9

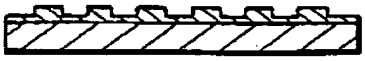

Fig.10

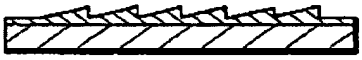

Fig.11

Fig.12

Fig.13

Fig.14

Fig.15

Therefore it would have been obvious to one of ordinary skill in the art that the coating deposition apparatus and method of Lang (722) can be modified to use optical devices with shaped facets in accordance with Hosokawa (289), to produce a lens with a high numerical aperture and develops a high efficiency .

Conclusion

4. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone numbers are (703) 872-9318 for regular response activity, and (703) 872-9319 for after-final responses. In addition the customer service fax number is (703) 872- 9317.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ
February 2, 2004

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800